REMARKS

Reconsideration of the rejected claims in view of this amendment is respectfully asked.

Submitted herewith is a petition to revive under 37 CFR §1.137(b).

Claims 1-22 are rejected under 35 U.S.C. §102 or 103 as being anticipated by U.S. patent no. 4,928,043 to Plunkett, or as being obvious in view of Plunkett, either alone or further in view of patent no. 4,173,796 to Jarvik. Plunkett discloses a back emf sampling circuit for a phase locked loop control for commutation of a DC permanent magnet brushless motor. Jarvik discloses an implantable circulatory assist device incorporating a brushless DC motor and motor commutating electronics therefor. The examiner essentially contends that it would have been obvious to substitute the Plunkett motor commutating electronics for that used in Jarvik.

An aspect of the invention is that not only the frequency of the drive voltage, but also its amplitude, are controlled in accordance with a speed control signal which corresponds to the difference between the desired rotor angular velocity and the rotor speed as inferred from the frequency of the drive voltage. In order to clarify this point, independent claim 1 has been amended to specify:

> "generating a speed control signal corresponding to a difference between a desired rotor angular velocity and a rotor speed inferred from a frequency of the drive voltage; and
>
> varying an amplitude of the drive voltage in accordance with the speed control signal."

Similarly, independent claim 13 has been amended to recite:

> "a speed control providing a speed control signal in accordance with a difference between a rotor angular velocity inferred from a frequency of the drive voltage and a commanded angular velocity, wherein an amplitude of the drive voltage is varied in accordance with the speed control signal."

Claims 12 and 17 have, accordingly, been canceled. This feature is illustrated in fig. 7, wherein the drive voltage amplitude control signal 762 from speed control is applied to a scale circuit 760 for controlling the amplitude of the drive voltage.

No such arrangement is disclosed or suggested by Plunkett or the other cited references.

New claim 23 is an independent version of original claim 18 which has, accordingly, been canceled. It differs from amended claim 13 in that the speed control signal is based on a difference between the commanded velocity and that inferred from the back emf.

New claim 24 is similar to original claim 19, which has been canceled, and specifies a pulse-width-modulated inverter and a programmable waveform generator providing a drive waveform to the inverter. No such arrangement is disclosed or suggested by Plunkett or the other cited references.

In view of the foregoing, it is respectfully submitted that, as amended, each of the remaining claims 1-11, 13-16, 23 and 24 is now believed to be in condition for allowance and the allowance thereof is respectfully asked.

Respectfully submitted,

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Marked-up Amended Claims

1. (Amended) A method, comprising the steps of:

driving a polyphase motor with a drive voltage;

sampling a back emf of a selected phase of the motor to determine positional error of a motor rotor only while a drive voltage of the selected phase is substantially zero;

generating a speed control signal corresponding to a difference between a desired rotor angular velocity and a rotor speed inferred from a frequency of the drive voltage; and

varying an amplitude of the drive voltage in accordance with the speed control signal.

13. (Amended) An apparatus, comprising:

a brushless DC motor;

a commutation control providing a commutation control signal for a selected phase of the motor in accordance with a sampled back electromotive force (emf) of that phase, wherein the back emf of the phase is sampled only while the corresponding drive voltage for the selected phase is substantially zero, wherein a frequency of a drive voltage of the brushless DC motor is varied in accordance with the commutation control signal; and

a speed control providing a speed control signal in accordance with a difference between a rotor angular velocity inferred from a frequency of the drive voltage and a commanded angular velocity, wherein an amplitude of the drive voltage is varied in accordance with the speed control signal.